Software for Application of HHT Technologies to Time Series Analysis, Phase II

Completed Technology Project (2007 - 2009)

Project Introduction

The NLNS software developed in phase I is a robust and user-friendly environment that NASA researchers can use to customize the latest HHT technologies for their applications in astrophysics, earth sciences, and exploration. The proposed technology includes the latest discoveries and inventions not available in the state-of-the-art. Its taxonomy includes gravitational sensors and sources, expert systems, portable data analysis tools, software development environments, and software tools for distributed analysis and simulation. The Hilbert-Huang Transform (HHT) and related analysis technologies were successful in detecting non-linear and transient LISA-signal components of very small magnitude with respect to the signal noise. Other types of NLNS analyses will include de-noising (filtering), spectral analysis, reconstruction, and registration, potentially extended to two-dimensional data. The proposed research and development team has participated in the latest cycle of technology development related to the HHT at the theoretical, implementation, and application levels. Not only will the creation of the proposed software contribute to the detection of gravitational wave signals (for both LIGO and LISA data) or understanding patterns of climate change temperature records from ice cores or monitoring structural dynamics, but also in other non-linear and non-stationary applications within and outside NASA's mission.

Primary U.S. Work Locations and Key Partners
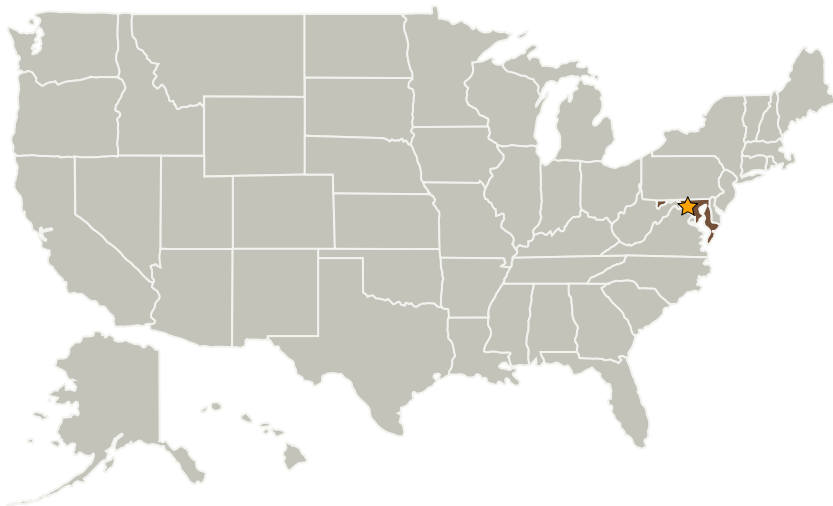
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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Goddard Space Flight Center (GSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
⭐Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Starodub, Inc.	Supporting Organization	Industry	Kensington, Maryland

Primary U.S. Work Locations
Maryland

Project Transitions

▶ **December 2007:** Project Start

✔ **December 2009:** Closed out

Project Management

Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Technology Areas

Primary:

- TX17 Guidance, Navigation, and Control (GN&C)
  └ TX17.6 Technologies for Aircraft TrajectoryGeneration, Management, and Optimization for Airspace Operations
    └ TX17.6.2 Tactical Management of Air Vehicles